

ABSTRACT

The present invention provides a high tensile strength hot-rolled steel sheet having superior strain aging hardenability, which has high formability and stable quality characteristics, and in which satisfactory strength is obtained when the steel sheet is formed into automotive components, thus enabling the reduction in weight of automobile bodies. Specifically, a method for producing a high tensile strength hot-rolled steel sheet having superior strain aging hardenability with a BH of 80 MPa or more, a Δ TS of 40 MPa or more, and a tensile strength of 440 MPa or more includes the steps of heating a steel slab to 1,000°C or more, the steel slab containing, in percent by mass, 0.15% or less of C, 2.0% or less of Si, 3.0% or less of Mn, 0.08% or less of P, 0.02% or less of S, 0.02% or less of Al, 0.0050% to 0.0250% of N, and optionally 0.1% or less in total of at least one of more than 0.02% to 0.1% of Nb and more than 0.02% to 0.1% of V, the ratio N (mass%)/Al (mass%) being 0.3 or more; rough-rolling the steel slab to form a sheet bar; finish-rolling the sheet bar at a finishing temperature of 800°C or more; cooling at a cooling rate of 20°C to 40°C/s or more within 0.5 second after the finish-rolling; and coiling at a temperature of 650°C to 450°C or less.